NOTE ON A GROUP OF VARIETIES OF THE PECTORAL SHEET OF MUSCLE.[1]

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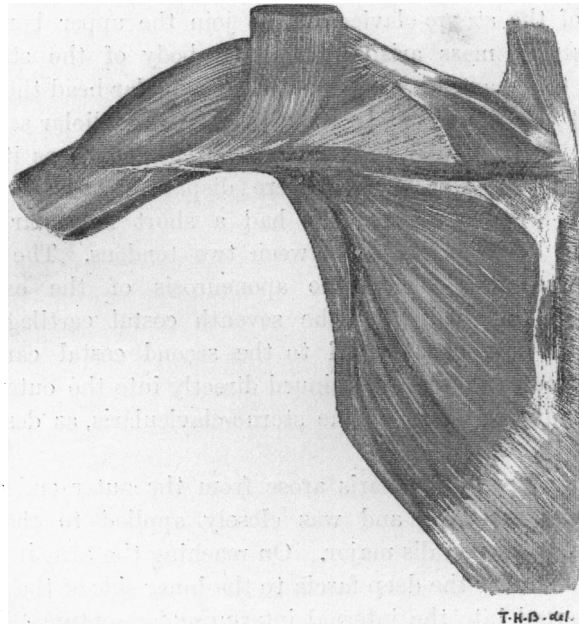
THE group of anomalous muscles which is the text of this note was found in a female subject aged 62. The left pectoral sheet was normally disposed, but on the right side the superficial manubrial portion of the pectoralis major was in great part absent, and there were present sternalis, sterno-clavicularis, and chondro-epitrochlearis muscles. The occurrence of such a series



of varieties of the same pectoral sheet is uncommon, and I have thought the case worthy of being recorded, partly on this account, but also because its features are of theoretical interest in relation to the morphology of the sternalis and the sterno-clavicularis.

[1] Read before the meeting of the Anatomical Society of Great Britain and Ireland, 28th April 1899.

The sterno-clavicularis arose from the side of the manubrium sterni, and by tendinous fibres from the second costal cartilage. The outer part of this tendinous origin was not attached to the cartilage, but directly continuous with the upper tendon of the sternalis, presently to be described. The muscle was attached above to the clavicle along its antero-inferior border, mainly by fleshy fibres, but at the outer end by a tendinous portion, which extended to the outer third of the bone under the deltoid. The greater part of the muscle lay beneath the clavicular head of the pectoralis major, on the costo-coracoid membrane, but at its inner end it came to the surface, owing to the defect in the great pectoral. The superficial manubrial section of that muscle was represented only by a narrow band, which crossed the surface of the sterno-clavicularis to join the upper border of the muscular mass arising from the body of the sternum. Between this manubrial band and the clavicular head there was a distinct interspace, but between it and the gladiolar section a considerable triangular interval was left, in which, as it were, the normal superficial fibres were displaced by the deeper abnormal layer. The sternalis had a short muscular belly, 2 in. long by $\frac{3}{4}$ in. broad, between two tendons. The lower tendon was attached to the aponeurosis of the external oblique, on a level with the seventh costal cartilage, the upper was in part attached to the second costal cartilage, but at its outer side was continued directly into the outer part of the tendinous origin of the sterno-clavicularis, as described above.

The chondro-epitrochlearis arose from the outer end of the sixth costal cartilage, and was closely applied to the deep surface of the pectoralis major. On reaching the arm it passed downwards under the deep fascia to the inner side of the biceps, to be inserted into the internal intermuscular septum, 2 inches above the internal epicondyle. It was a band $\frac{3}{4}$ in. broad, and remained fleshy to its insertion; usually the muscular fibres end on a rounded tendon, on a level with the insertion of the pectoralis major.

The nerve supply of the sternalis was not definitely ascertained, as the parts had been disturbed before my attention had been drawn to the muscle, but the sterno-clavicularis received,

on its deep aspect, a branch of some size from the external anterior thoracic nerve.

In his "Catalogue of Muscular Varieties"[1] Professor Macalister describes two muscles arising from the first costal cartilage and manubrium, and inserted into the clavicle—1st, Supraclavicularis; 2nd, Præclavicularis medialis. He notes a case in which he found the first associated with a rectus sternalis, a levator claviculæ, a chondro-epitrochlearis, and an achselbogen,—much the same group of varieties as in the present case.

Testut[2] does not distinguish the two varieties, but describes them both under one head, as sterno-clavicularis anterior, arising from the sternum below the sternal head of the sterno-mastoid, and inserted into the inner, middle, or outer third of of the clavicle. The muscle may, however, arise from the first rib cartilage, the anterior sterno-clavicular ligament, or the sternal tendon of the sterno-mastoid (supraclavicularis of Macalister), or from the lower part of the manubrium (Wood), and in my case it extends to the second costal cartilage. It is covered by the pectoralis major, and separated from the subclavius by the costo-coracoid membrane.

The muscle evidently represents a portion of the deep lamella of the pectoral sheet arising from the manubrium, and it is significant that when present, either in its single or its double form (interclavicularis anterior digastricus), there is frequently a defect in the pectoralis major. In my case it is the manubrial portion that is defective, and it looks as if the deeper muscle, not usually present, had displaced the fibres normally springing from the lower part of the manubrium and the second costal cartilage. It is, however, as a rule—corresponding to the more usual origin of the sterno-clavicular fibres from the upper part of the manubrium or first costal cartilage—the inner part of the clavicular head, sometimes including the upper part of the manubrial portion, that is wanting, and in this case the defect may be looked upon as having the same explanation.[3]

[1] *Trans. Roy. Irish Acad.*, vol. xxv.

[2] *Les Anomalies Musculaires chez l'Homme*, etc., 1884.

[3] See a case described by Dwight, *Jour. Anat. and Phys.*, vol. xxii., 1888, p. 98.

The sterno-clavicularis is therefore, in virtue of its position, a "deep manubrial slip,"[1] and, in virtue of its innervation, belongs to the same category as the pectoralis minimus, and the other slips described as arising from the same point. They may all be regarded as different forms of the part of the deep lamella of the pectoral sheet, usually suppressed in man, arising from the manubrium, and supplied by the external anterior thoracic nerve.

So much has been written on the sternalis, and such general interest taken in it, that I need make no comment on the general question, except to point out the bearing of the case on Professor Cunningham's theory as to the nature of the muscle. He writes:[2] "the appearance of the parts produced the impression that the sternalis had been formed by a deviation or dislocation of the pectoral fibres from above, downwards and inwards. The nerve of supply (external or internal anterior thoracic) is dragged inwards by the deviating fibres, and this accounts for its great length. . . . But additional proof . . . is found in the occasional recurrent course of the intercostal nerves. This suggests in the most striking manner the probability that the nerves have been pushed inwards by the deviating fibres." Again referring to the cases in which a sternalis is associated with a defect in the pectoralis major (in anencephalic foetuses), he says:[3] "it is reasonable to suppose that the gap is caused by the abstraction of this portion of the muscle to form the sternalis."

The case under consideration, so far as it goes, tends distinctly to support this theory as to the nature of this much described muscle; and applying it to the individual case, it seems reasonable to conclude that the sterno-clavicularis, coming to the surface on the manubrium and second costal cartilage, has caused a displacement of the superficial fibres arising normally from these parts, and that these fibres have been dislocated downwards and inwards to form the sternalis, in the manner suggested by Professor Cunningham.

[1] For Windle's subdivision of the pectoral sheet according to its innervation, see his paper in *Trans. Roy. Irish. Acad.*, vol. xxix.

[2] *Jour. Anat. and Phys.*, vol. xxii., 1888, p. 399.

[3] *Loc. cit.*, p. 400.